

FORSLÖW  
Serial No. 09/087,496  
May 7, 2003  
In Reply to Office Action dated March 7, 2003

**IN THE CLAIMS**

The following claim set replaces all prior versions, and listings, of claims in the application:

49. (currently amended) In a mobile radio communications system having plural mobile radio terminals communicating with a radio network over a radio interface using radio resources from a pool of radio resources that may be allocated to the plural mobile radio terminals, where a mobile radio terminal communicates packet data with an external network by way of a packet gateway node associated with the radio network, a method comprising:

establishing a packet session over the radio interface for the mobile radio terminal using radio resources from the pool during which plural application flows are communicated with an external network entity, each application flow having a corresponding stream of packets;

defining a corresponding quality of service parameter for each of the plural application flows such that different quality of service parameters may be defined for different ones of the application flows; and

determining whether radio resources from the pool are available to support the quality of service parameters defined for each of the plural application flows;

wherein establishing the packet session includes:

activating a packet session for the mobile radio terminal so that the mobile radio terminal is in communication with the gateway node, and

the mobile radio terminal requesting an end-to-end configuration between the mobile radio terminal and the external network entity, and

wherein the end-to-end configuration request establishes a network packet layer bearer between the mobile radio terminal and the gateway node permitting relay of data

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~~packets between the external network entity and the mobile radio terminal even though a network packet layer address is not assigned to the mobile radio terminal.~~

50. (previously added) The method in claim 49, further comprising:  
delivering packets corresponding to each application flow from the external network entity to the mobile radio terminal in accordance with the defined corresponding quality of service.

51. (current amended) The method in claim 50, wherein the quality of service is defined for said each application flow at a network packet layer for ~~an~~ ~~the~~ end-to-end communication ~~from the mobile host and the external network entity~~.

*C1 Cont.*  
52. (previously added) The method in claim 49, wherein different qualities of service have different allocated bandwidths, delays, or reliability.

53. (previously added) The method in claim 52, wherein the different quality of services include one class of service that is best effort where packets in an application flow may be dropped and another class of service that is predictive where packets in an application flow are not dropped.

54. (previously added) The method in claim 49, wherein a quality of service includes a delay class that specifies one or more of the following: a maximum packet transfer rate, a mean packet transfer rate, and a packet burst size of an application flow.

55. (previously added) The method in claim 49, further comprising:  
storing subscription information for the mobile radio terminal specifying whether the mobile radio terminal may request a quality of service for specific application flows, and  
checking the subscription information before defining quality of service parameters.

56. (previously amended) The method in claim 55, further comprising:

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making available for the packet session each quality of service to which a user of the mobile radio terminal subscribes.

57. (previously added) The method in claim 49, wherein session control messages are communicated between the mobile radio terminal and the gateway node using a best efforts quality of service delay class.

58. ✓ (cancel)

59. ✓ (cancel)

*C1  
Cont.*

60. (currently amended) The method in claim ~~59~~ 49, wherein the gateway node functions as a dynamic host configuration agent serving the mobile radio terminal as a client relaying packets between the mobile radio terminal and the external network entity.

61. (previously added) The method in claim 60, further comprising:  
adding a remote agent identification corresponding to a mobile radio terminal identifier to messages intended for the external network entity.

62. (previously added) The method in claim 61, wherein during configuration, the dynamic host configuration agent captures and stores a unique network packet layer address for the mobile radio terminal for the established session for each application flow activated during the established session.

63. (previously added) The method in claim 62, further comprising:  
establishing a data communications tunnel corresponding to the network layer bearer between the gateway node and the mobile radio terminal, and  
establishing a relationship in the gateway node between a mobile radio terminal's identifier, the established tunnel, and the network packet layer address for the mobile radio terminal for the established session.

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64. (previously added) The method in claim 63, further comprising:

analyzing packets received at the gateway node and permitting only packets having a destination or source corresponding to one of the mobile radio terminal network layer addresses stored for the established session.

65. (previously added) The method in claim 63, further comprising:

the gateway node routing packets according to a shortest path based on the network layer address for the mobile radio terminal for the established session.

*C1 Cont.*

66. (currently amended) In a mobile radio communications system having plural mobile radio hosts communicating with a radio network over a radio interface using radio resources from a pool of resources that may be allocated to the plural mobile radio hosts where a mobile host communicates packet data with an external network by way of a packet gateway node associated with the radio network and a packet serving node associated with the radio network, a method comprising:

establishing a packet session for the mobile radio host over the radio interface using radio resources from the pool during which plural application flows are communicated between the mobile host and an external network entity, each application flow having a corresponding stream of packets;

making a reservation request for a particular quality of service for an individual application flow associated with the packet session;

determining whether the reservation request can be met with radio resources from the pool; and

if so, establishing a logical bearer between the mobile radio host and the gateway node to bear plural ones of the individual application flows having different corresponding quality of services;.

classifying and scheduling packets corresponding to each application flow from the external network to the mobile radio host over the bearer in accordance with the quality of service corresponding to the application packet stream;

the serving node monitoring each of the application flows from the gateway node to determine whether a data transmission volume limit is exceeded; and

if so, the serving node discarding packets corresponding to an application flow having a lowest quality of service reserved.

✓  
67. (cancel)

68. (previously added) The method in claim 66, further comprising:

the serving node determining if the reservation request for the particular quality of service is permitted by a subscription corresponding to the mobile radio host.

69. (previously added) The method in claim 66, further comprising:

the serving node evaluating if the reservation request for the particular quality of service can be supported from the serving node to the mobile radio host based on a current traffic load of existing radio communications in the area where the mobile radio host is being served.

70. (previously added) The method in claim 69, wherein the evaluating step includes the serving node estimating a delay and a bandwidth requirement corresponding to the requested quality of service.

71. (previously added) The method in claim 70, further comprising:

the serving node providing the gateway node the estimated delay and an estimate of a bandwidth requirement corresponding to the reservation request, and

the gateway node providing the delay and bandwidth estimates to a network layer protocol.

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72. (previously added) The method in claim 66, further comprising:  
the gateway node renewing the quality of service reservation.

73. (previously added) The method in claim 66, further comprising:  
the gateway node monitoring said each application flow to ensure that the reserved quality of service for that application flow is met.

74. (previously added) The method in claim 67, further comprising:  
the gateway node scheduling transfer of packets corresponding to one of the application flows to ensure that the reserved quality of service for that application flow is met.

75. (previously added) The method in claim 67, further comprising:  
the gateway node classifying packets using the reserved quality of service for the application flow to which each packet belongs.

76. (cancel)

77. (currently amended) In a mobile radio communications system having plural mobile radio hosts communicating with a radio network over a radio interface using radio resources from a pool of radio resources that ~~may be~~ allocated to the plural mobile radio hosts, where the mobile radio hosts communicate packet data with an external network by way of a packet gateway node and a packet serving node associated with the radio network, a method comprising:  
establishing a packet session over the radio interface for a mobile radio host using radio resources from the pool during which plural application flows are communicated with an external network entity, each application flow having a corresponding stream of packets;  
defining a corresponding quality of service parameter for each of the plural application flows such that different quality of service parameters may be defined for different ones of the application flows; and

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the serving node merging packets from different sessions with the same quality of service destined for different mobile radio hosts within a same geographical service area; and

the serving node assigning packets destined for a same geographical service area but with different qualities of service to different priority queues corresponding to the different qualities of service.

wherein a larger number of packets are removed from a queue having a higher quality of service than a queue having a lower quality of service.

78. (previously added) The method in claim 77, wherein the merging is performed using first in first out scheduling except when packets cannot be delivered within a specified time.

79. (previously added) The method in claim 77, further comprising:

80-114. (cancel)

115. (currently amended) For use in a mobile radio communications system having plural mobile radio hosts communicating with a radio network over a radio interface using radio resources from a pool of radio resources that may be allocated to the plural mobile radio hosts, where the mobile radio hosts communicate packet data with an external network by way of a packet gateway node and a packet serving node associated with the radio network, wherein a packet session is established over the radio interface for a mobile radio host using radio resources from the pool during which plural application flows are communicated with an external network entity, each application flow having a corresponding stream of packets, and a corresponding quality of service parameter is defined for each of the plural application flows such that different quality of service parameters may be defined for different ones of the application flows, a radio packet network node, comprising:

~~electronic circuitry configured to merge packets from different sessions with a same quality of service destined for different mobile radio hosts within a same geographical service area; and to assign packets destined for a same geographical service area but with different qualities of service to different priority queues corresponding to the different qualities of service, wherein the electronic circuitry is configured to remove a larger number of packets from a queue having a higher quality of service than a queue having a lower quality of service.~~

116. (previously added) The radio packet network node in claim 115, wherein the electronic circuitry is configured to perform the merging using first in first out scheduling except when packets cannot be delivered within a specified time.

*C1  
Cont.*  
✓ ✓  
117. (cancel)

118. (currently amended) ~~For use in a mobile radio communications system having plural mobile radio hosts communicating with a radio network over a radio interface using radio resources from a pool of radio resources that may be allocated to the plural mobile radio hosts, where the mobile radio hosts communicate packet data with an external network by way of a packet gateway node and a packet serving node associated with the radio network, wherein a packet session is established over the radio interface for a mobile radio host using radio resources from the pool during which plural application flows are communicated with an external network entity, each application flow having a corresponding stream of packets, and a corresponding quality of service parameter is defined for each of the plural application flows such that different quality of service parameters may be defined for different ones of the application flows, a radio packet network node, comprising:~~

~~electronic circuitry configured to merge packets from different sessions with a same quality of service destined for different mobile radio hosts within a same geographical service area~~ ~~The radio packet network node in claim 115, wherein the electronic circuitry is~~

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~~configured and~~ to monitor each of the application flows to determine whether a data transmission volume limit is exceeded, and if so, to discard packets corresponding to an application flow having a lowest quality of service reserved.

*C1  
Cont.*  
119. (previously added) The radio packet network node in claim 115, wherein the electronic circuitry is configured to determine if a reservation request for a particular quality of service is permitted by a subscription corresponding to the mobile radio host.

120. (previously added) The radio packet network node in claim 119, wherein the electronic circuitry is configured to evaluate if the reservation request for the particular quality of service can be supported from the radio packet network node to the mobile radio host based on a current traffic load of existing radio communications in the area where the mobile radio host is being served.

121. (previously added) The radio packet network node in claim 120, wherein the evaluation includes an estimation of a delay and a bandwidth requirement corresponding to the requested quality of service.

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